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EXAMINER	
CHANG, JON CARLTON	
ART UNIT	**PAPER NUMBER**
2623	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/937,135	FERRETTI ET AL.	
	Examiner	Art Unit	
	Jon Chang	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-15 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,7,9-13 and 15 is/are rejected.

7)☒ Claim(s) 2-6,8 and 14 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 21 September 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 9/21/01, 1/14/02.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Specification

1. The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code (page 2, line 25). Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01.

2. The disclosure is objected to because of the following informalities:

a) on page 12, line 4, "always securely to" should be changed to, --to always securely--.

b) on page 12, line 8, --is—should be inserted between "this" and "not".

c) on page 12, line 31, "simply to verify" should be changed to, –to simply verify--.

Appropriate correction is required.

Claim Objections

3. Claims 11 and 14 are objected to because of the following informalities:

a) In claim 11, line 2, "the pruning stage" lacks antecedent basis. It appears that claim 11 was intended to depend from claim 7.

b) Claim 14 depends from itself. It appears it was intended to depend from claim 13.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 13 is confusing. In particular, "...to identify, by filling the area external thereto, the area inside each edge" is unclear. What is the area being filled with? What is the area external to?

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,740,266 to Weiss et al. (hereinafter "Weiss").

Regarding claim 1, Weiss discloses a method for identifying closed areas and defining masks in a digital image, comprising the following stages:

dividing the image into a plurality of points and memorising values representative at least of the relative luminance of each point of the image in an ordered sequence in the memory of an electronic processor (The digital images, column 7, line 39, is inherently divided into points, namely pixels a pixel having a

defined luminance. The system is based on a microcomputer, column 7, lines 14-15, which includes a memory, e.g., Fig.1, element 12, for storing data. Modern processors also typically posses cache memory for storing data. Operations involving microcomputers typically require storing data for processing. The "ordered sequence" is not explicitly explained in Applicant's specification, so the Examiner interprets this to read on either the inherent order of the pixels themselves, e.g., by their x,y coordinates, or, by the sequential addressing used in microcomputer memory systems, used to store the data.),

memorising values representative of the luminance gradient of each point of the image, determined on the basis of the luminance values of each point and of the surrounding points, in an ordered sequence in the memory of the electronic processor (as all of the pixel values are stored, the luminance values are memorized; column 8, lines 18-19; note "intensity gradient", column 8, line 19, implies intensity of the pixels, effectively the luminance),

preparing an intermediate threshold value, in order to sub-divide the luminance gradient values into a first and a second group, (column 8, lines 20-21; thresholding inherently results in two groups, e.g., "on" and "off", or dark and light pixels, etc.),

memorising in the memory of the electronic processor an ordered series of values identifying borders, each defined by a cluster of adjacent points whose gradient value belongs to the first group of luminance gradient values (note Figs.16-19; borders are inherently clusters of adjacent points, of the value "on" or "1" for example),

selecting closed edges, defined by the borders whose points all have at least two neighbours whose luminance gradient values belong to the first group (e.g., Figs., 16, 17, 18, 19; note that closed contours are selected, a contour being closed implying that all points on the border have at least two neighbors; the first group are "on" or dark pixels),

memorising in the memory of the electronic processor the points of the image that are included within each edge, taken in succession, in order to define masking areas of the digital image corresponding to objects depicted in this image (the mask is defined in Fig.20).

It is noted that in claim 1, the "preparing" step does not require, "sub-dividing the luminance gradient values into a first and a second group." The use of the phrase "in order to" merely sets forth an intended use of "preparing the intermediate threshold value" but does not require sub-dividing. Similarly, the last "memorising" step does not require "defining masking areas of the digital image corresponding to objects..." The use of the phrase "in order to" merely sets forth an intended use of the "memorising..."

As to claim 7, Weiss discloses a method for identiàing closed areas and defining masks in a digital image as claimed in claim 1, characterised in that, following the stage of selection of the closed edges, it comprises a stage of pruning of the open borders (note for example, in the sequence of Figs.15-19, all open borders have been removed).

7. Claims 1, 7, 11 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,335,298 to Hevenor et al. (hereinafter "Hevenor").

Regarding claim 1, Hevenor discloses a method for identifying closed areas and defining masks in a digital image, comprising the following stages:

dividing the image into a plurality of points and memorising values representative at least of the relative luminance of each point of the image in an ordered sequence in the memory of an electronic processor (The digital images, column 17, line 1, is inherently divided into points, namely pixels, column 1, line 54, a pixel having a defined luminance. The system is based on a computer, column 17, lines 3-4, which inherently includes a memory, for storing data. Modern processors also typically posses cache memory for storing data. Operations involving microcomputers typically require storing data for processing. The "ordered sequence" is not explicitly explained in Applicant's specification, so the Examiner interprets this to read on either the inherent order of the pixels themselves, e.g., by their x,y coordinates, or, by the sequential addressing used in computer memory systems, used to store the data.),

memorising values representative of the luminance gradient of each point of the image, determined on the basis of the luminance values of each point and of the surrounding points, in an ordered sequence in the memory of the electronic processor (as all of the pixel values are stored, the luminance values are memorized; column 3, lines 26-28; column 4, line 55 to column 5, line 41; the Sobel operator, is a gradient operator, which provides a luminance gradient at each point of the image),

preparing an intermediate threshold value, in order to sub-divide the

luminance gradient values into a first and a second group (the relaxation algorithm, column 3, lines 32-34, column 5, line 43 to column 8, line 21, results in a binary image, column 3, line 33 and column 8, lines 24-25, which effectively thresholds the image (divides the gradient image into two values, 1 and 0) based on the compatibility coefficients and reinforcement process),

memorising in the memory of the electronic processor an ordered series of values identifying borders, each defined by a cluster of adjacent points whose gradient value belongs to the first group of luminance gradient values (column 3, lines 43-44; column 12, lines 6-16; connected components are clusters of adjacent points),

selecting closed edges, defined by the borders whose points all have at least two neighbours whose luminance gradient values belong to the first group (note that a curve an be closed, column 16, line 28, curve being closed implies that all points on the border have at least two neighbors; the first group are "on" or dark pixels),

memorising in the memory of the electronic processor the points of the image that are included within each edge, taken in succession, in order to define masking areas of the digital image corresponding to objects depicted in this image (column 2, line 52; ultimate result is to extract an object in an image, essentially masking the areas of corresponding to the objects).

As noted previously, in claim 1, the "preparing" step does not require, "sub-dividing the luminance gradient values into a first and a second group." The use of the phrase "in order to" merely sets forth an intended use of "preparing the intermediate threshold value" but does not require sub-dividing. Similarly, the last "memorising" step

does not require "defining masking areas of the digital image corresponding to objects..." The use of the phrase "in order to" merely sets forth an intended use of the "memorising..."

As to claim 7, Hevenor discloses method for identifying closed areas and defining masks in a digital image as claimed in claim 1, characterised in that, following the stage of selection of the closed edges, it comprises a stage of pruning of the open borders (note in comparing Fig.1 to Fig.12, an open border, which is approximately 4 o'clock with respect to the numeral 16 near the center of the frame in Fig.1, has been pruned or eliminated in Fig.12).

As to claim 11, Hevenor discloses a method for identifying closed areas and defining masks in a digital image as claimed in claim 1, characterised in that, following the pruning stage, it comprises a further stage of elimination of lens edges, defined by edges whose ends are closed as eyes and are connected by an intermediate border section (note the lens edge in Fig.1, approximately 4 o'clock with respect to the numeral 16 near the center of the frame, has been eliminated in Fig.12).

As to claim 12, Hevenor discloses a method for identifying closed areas and defining masks in a digital image as claimed in claim 11, characterised in that the stage of elimination of the lens edges includes the elimination of the intermediate border section (referring to the explanation provided for claim 11, note also that the intermediate border in Fig.1 has been eliminated in Fig.12).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Weiss and U.S. Patent 4,916,531 to Genz et al. (hereinafter "Gengz").

With regard to claim 9, Weiss does not disclose a first preliminary stage of acquisition of a colour image by digitisation means functionally connected to the electronic processor, a second preliminary stage of memorisation of a sequence of values representative of colour parameters of points of this image, and a third preliminary stage of conversion of these colour parameter values into equivalent values comprising, for each point of the image, at least one value representative of the

luminance of the point. However, Genz teaches acquisition of a color image (Fig.1, input to block 22); memorizing a sequence of values representative of color parameters of points of the image (e.g., buffering inherent in the A/D, block 22, or in block 40, where each value is held, if only temporarily), converting the color parameter into equivalent values at least one representative of the luminance of the point (Fig.1, element 40; column 8, lines 38-45; the I value, or intensity, is equivalent to luminance). Color acquisition provides extended capabilities to Weiss' method. Further, Genz states that it is easier to detect edges with HSI then with RGB (column 8, lines 47-49). Therefore, it would have been obvious to one of ordinary skill in the art to modify Weiss' method according to Genz.

10. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Weiss and U.S. Patent 5,764,817 to Suzuki et al. (hereinafter "Suzuki").

With regard to claim 10, Weiss does not disclose that the intermediate threshold value is proportional to the mean of the luminance gradient values of all the points of the digital image. However, this is well known in the art as evidenced by Suzuki (column 8, lines 10-12; the gray level is a measure of luminance). Suzuki is concerned with detecting edges (column 7, lines 66-67), as is Weiss. Calculating the threshold as proportional to the mean of luminance is easily implemented, and does not involve high processing power. Therefore, it would have been obvious to one of ordinary skill in the art to modify Weiss' method according to Suzuki. Note that in the combination, the

thresholding is performed after the gradient process in Weiss, and therefore the mean values would be of the gradient values.

11. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Weiss and U.S. Patent 5,181,261 to Nagao.

Regarding claim 15, Weiss does not disclose at least one interactive modification of the values of points, borders and/or closed areas by a user, carried out by means of inputting means connected to the electronic processor, comprising a stage of display of the borders on video means and including at least one operation selected from the group of operations comprising:

an operation to open closed edges, by modifying the values stored on the processor and associated with points belonging to a closed edge and identified by the inputting means,

an operation to close open edges, by modifying the values stored on the processor and associated with points whose luminance gradient values are lower than the predetermined threshold value and that are identified by the user by means of the inputting means,

an operation to assign a closed area to a group of areas of different hierarchy, by identification by the user, by means of the inputting means, of at least one point of this closed area.

Essentially, this amounts to manual/interactive operation of at least one of various automated processes disclosed in Weiss (Weiss for examples teaches opening

closed edges, e.g., the one of the closed edges in Fig.18, is opened to an extreme in Fig.19, i.e., it is removed; Weiss also teaches closing open edges, note Fig.17 to Fig.18). Such manual/interactive operation is well known in the art. For example, Nagao teaches this (column 3, lines 47-49). Interactive modification by a user allows more precise control of the processing. Therefore, it would have been obvious to one of ordinary skill in the art to modify Weiss according to Nagao.

12. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Hevenor and U.S. Patent 4,916,531 to Genz et al. (hereinafter "Gengz").

With regard to claim 9, Hevenor does not disclose a first preliminary stage of acquisition of a colour image by digitisation means functionally connected to the electronic processor, a second preliminary stage of memorisation of a sequence of values representative of colour parameters of points of this image, and a third preliminary stage of conversion of these colour parameter values into equivalent values comprising, for each point of the image, at least one value representative of the luminance of the point. However, Genz teaches acquisition of a color image (Fig.1, input to block 22); memorizing a sequence of values representative of color parameters of points of the image (e.g., buffering inherent in the A/D, block 22, or in block 40, where each value is held, if only temporarily), converting the color parameter into equivalent values at least one representative of the luminance of the point (Fig.1, element 40; column 8, lines 38-45; the I value, or intensity, is equivalent to luminance). Color acquisition provides extended capabilities to Hevenor's method. Further, Genz states

that it is easier to detect edges with HSI then with RGB (column 8, lines 47-49). Therefore, it would have been obvious to one of ordinary skill in the art to modify Hevenor's method according to Genz.

13. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Hevenor and U.S. Patent 5,764,817 to Suzuki et al. (hereinafter "Suzuki").

With regard to claim 10, Weiss does not disclose that the intermediate threshold value is proportional to the mean of the luminance gradient values of all the points of the digital image. However, this is well known in the art as evidenced by Suzuki (column 8, lines 10-12; the gray level is a measure of luminance). Suzuki is concerned with detecting edges (column 7, lines 66-67), as is Weiss. Calculating the threshold as proportional to the mean of luminance is easily implemented, and does not involve high processing power. Therefore, it would have been obvious to one of ordinary skill in the art to modify Hevenor's method according to Suzuki. Note that in the combination, the thresholding is performed after the gradient process in Hevenor, and therefore the mean values would be of the gradient values.

Allowable Subject Matter

14. Claims 2-6, 8 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

15. Claim 13 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jon Chang whose telephone number is (703)305-8439. The examiner can normally be reached on M-F 8:00 a.m.-6:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703)308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jon Chang
Primary Examiner
Art Unit 2623

Jon Chang
March 21, 2005